Take out your June 2016 exam and complete the following questions: 3, 10, 23, 24

3 Kevin's work for deriving the equation of a circle is shown below.

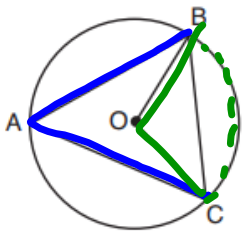
$$x^2 + 4x = -(y^2 - 20)$$

STEP 1 $x^2 + 4x = -y^2 + 20$
STEP 2 $x^2 + 4x + 4 = -y^2 + 20 - 4$
STEP 3 $(x + 2)^2 = -y^2 + 20 - 4$
STEP 4 $(x + 2)^2 + y^2 = 16$

In which step did he make an error in his work?

(1) Step 1
(2) Step 2
(3) Step 3
(4) Step 4

10 In the diagram below of circle O, $\overline{OB}$ and $\overline{OC}$ are radii, and chords $\overline{AB}$, $\overline{BC}$, and $\overline{AC}$ are drawn.



$m\angle BAC = \frac{1}{2} m\overset{\frown}{BC}$

$m\angle BOC$

Which statement must always be true?

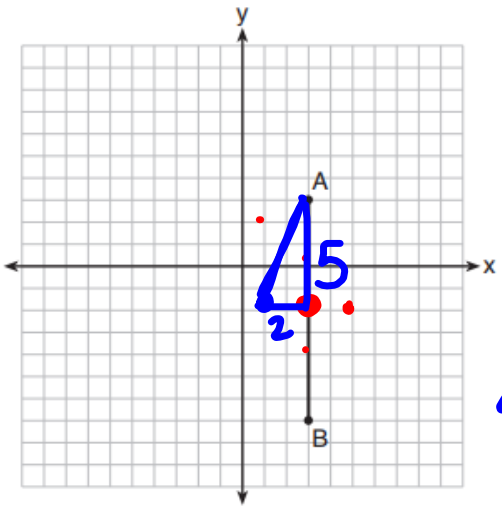
(1) $\angle BAC \cong \angle BOC$

(2) $m\angle BAC = \frac{1}{2} m\angle BOC$

(3) $\triangle BAC$ and $\triangle BOC$ are isosceles.

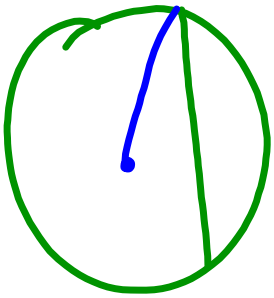
(4) The area of $\triangle BAC$ is twice the area of $\triangle BOC$.

23 The graph below shows $\overline{AB}$, which is a chord of circle O. The coordinates of the endpoints of $\overline{AB}$ are $A(3,3)$ and $B(3,-7)$. The distance from the midpoint of $\overline{AB}$ to the center of circle O is 2 units. **computations.**



$2^2+5^2=r^2$

$29=r^2$



What could be a correct equation for circle O?

(1) $(x-1)^2+(y+2)^2=29$

(2) $(x+5)^2+(y-2)^2=29$

(3) $(x-1)^2+(y-2)^2=25$

(4) $(x-5)^2+(y+2)^2=25$

$\frac{m^\circ}{360}=\frac{A}{\pi r^2}$

24 What is the area of a sector of a circle with a radius of 8 inches and formed by a central angle that measures 60°?

(1) $\frac{8\pi}{3}$

(2) $\frac{16\pi}{3}$

(3) $\frac{32\pi}{3}$

(4) $\frac{64\pi}{3}$

Geometry Name_____

HW 13-4 Period_____ Date_____

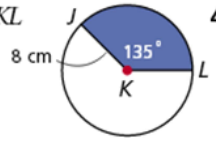
Find the area of each sector. Give your answer in terms of π and rounded to the nearest hundredth.

2. sector PQR

$A = 9\pi\ m^2$

$A = 28.27\ m^2$

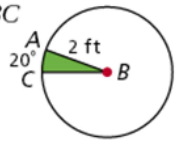
3. sector JKL



$A = 24\pi\ cm^2$

$A = 75.40\ cm^2$

4. sector ABC



$A = \frac{2\pi}{9}\ ft^2$

$A = 0.70\ ft^2$

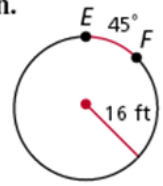
5. The beam from a lighthouse is visible for a distance of 3 miles. To the nearest square mile, what is the area covered by the beam as it sweeps on arc of 150°?

$\frac{m}{360} = \frac{L}{2\pi r}$

$A = 12\ mi^2$

Find each arc length. Give your answer in terms of π and rounded to the nearest hundredth.

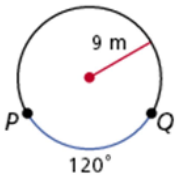
9. $\overset{\frown}{EF}$



$L=4\pi\ ft$

$L=12.57\ ft$

10. $\overset{\frown}{PQ}$



$L=6\pi\ m$

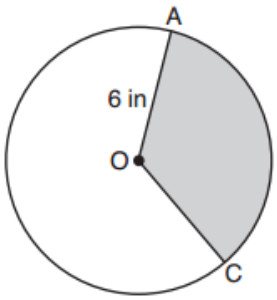
$L=18.85\ m$

11. an arc with measure 20° in a circle with radius 6 in.

$L=\frac{2\pi}{3}\ in$

$L=2.09\ in$

29 In the diagram below of circle O, the area of the shaded sector AOC is 12π in^2 and the length of $\overline{OA}$ is 6 inches. Determine and state $m\angle AOC$.



Class Notes 8.5: Radian Measure

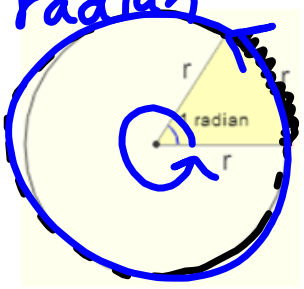
$C = 2\pi r$

Radian Measure

$360° = 2\pi$ radian

A radian is a unit of measure for angles.

One radian is the angle made at the center of a circle by an arc whose length is equal to the radius of the circle.



As seen in the figure above, a radian is defined by an arc of a circle. The length of the arc is equal to the radius of the circle. Because of this the radian is a fixed size no matter what the size of the circle is.

How many radians (radii) are in a full circle?

A full circle has circumference of $C = 2\pi r$ so number of radians (radii) = 2π.

Example:
If a circle has a radius of 5, then number of radians is _____ = _____.

We know that 360 ° are in a circle. So let's use this to determine how much a radian is in degrees.

So we know that $360° = 2\pi$ radians.

We can use this information to convert back and forth from radians to degrees.

$360° = 2\pi$ radians

$\frac{360}{360} = \frac{2\pi}{360}$

$1° = \frac{\pi}{180}$ radians

$360° = 2\pi$ radians

$\frac{2\pi}{2\pi} = \frac{2\pi}{2\pi}$

1 radian = $\frac{180}{\pi}$ °

$\sim 57.3°$

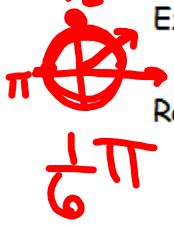
REFERENCE SHEET

Radians	1 radian $= \frac{180}{\pi}$ degrees
Degrees	1 degree $= \frac{\pi}{180}$ radians

Radians	1 radian $= \frac{180}{\pi}$ degrees
Degrees	1 degree $= \frac{\pi}{180}$ radians

radians = $\frac{\pi}{180^\circ} \times$ degrees

$\pi/2$ D → R × $\frac{\pi}{180}$.



Example: Let's convert 30° to radians.

Radians = $\frac{\pi}{180^\circ} \times \frac{30^\circ}{1} = \frac{\pi}{6}$ radians

Now you try. Convert the following to radians.

1. 45° · $\frac{\pi}{180} = \frac{\pi}{4}$

2. -60° · $\frac{\pi}{180} = -\frac{\pi}{3}$

3. 90° · $\frac{\pi}{180} = \frac{\pi}{2}$

4. -120° · $\frac{\pi}{180} = -\frac{2\pi}{3}$

5. 75° · $\frac{\pi}{180}$

How would you convert from radians to degrees?

Degrees = _____

R → D × $\frac{180}{\pi}$

Radians	1 radian = $\frac{180}{\pi}$ degrees
Degrees	1 degree = $\frac{\pi}{180}$ radians

Example: Let's convert $\frac{7\pi}{6}$ to degrees.

degrees = $\frac{180^\circ}{\pi} \cdot \frac{7\pi}{6}$ = 210°

Now you try. Convert the following radians to degrees.

1. $\frac{11\pi}{6} \cdot \frac{180}{\pi}$ 330°

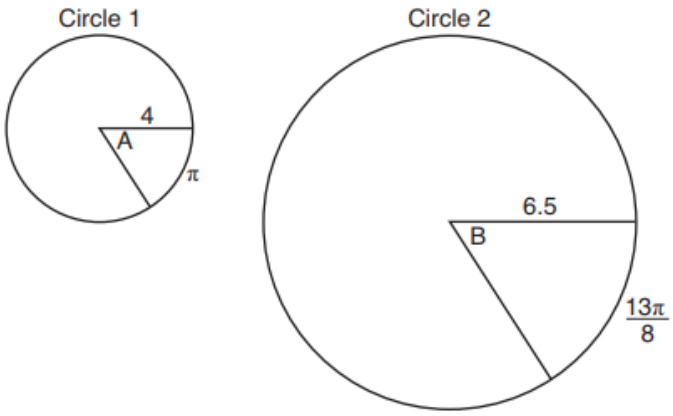
2. $\frac{5\pi}{4} \cdot \frac{180}{\pi} = 225^\circ$

3. $\frac{3\pi}{4} \cdot \frac{180}{\pi} = 135$

4. $\frac{5\pi}{6} \cdot \frac{180}{\pi} = 150^\circ$

5. 2.7 · $\frac{180}{\pi} = 154.7$

29 In the diagram below, Circle 1 has radius 4, while Circle 2 has radius 6.5. Angle A intercepts an arc of length π, and angle B intercepts an arc of length $\frac{13\pi}{8}$.



Dominic thinks that angles A and B have the same radian measure. State whether Dominic is correct or not. Explain why.

August 2017

23 In a circle with a diameter of 32, the area of a sector is $\frac{512\pi}{3}$. The measure of the angle of the sector, in radians, is

(1) $\frac{\pi}{3}$

(2) $\frac{4\pi}{3}$

(3) $\frac{16\pi}{3}$

(4) $\frac{64\pi}{3}$